

WHAT IS CLAIMED IS:

1. A rotary electric machine comprising:
a rotor; and
a stator having a stator winding with a plurality of segments,
wherein:

the segments comprise a plurality of regular segments
regularly arranged to provide a part of the stator winding,

at least one irregular segment disposed to provide a
remaining part of the stator winding,

a first insulating layer covering a first surface of the segments,
and

a second insulating layer covering a second surface of the
segments, wherein the second insulating layer has a higher insulation
performance than the first insulating layer, and the second surface
relates to an insulation to the irregular segment and is smaller than
the first surface.

2. The rotary electric machine according to claim 1, wherein
the segments form a coil end group on an axial end of the stator, and
wherein the irregular segment provides an irregular connection
different from connections provided by the regular segments.

3. The rotary electric machine according to claim 1, wherein
the segments form a coil end group on an axial end of the stator, and
wherein the irregular segment has a portion which extends along the
coil end group.

4. The rotary electric machine according to claim 1, wherein
the regular segments have first coil end portions to form a first coil end

group on a first end of the stator and second coil end portions to form a second coil end group on a second end of the stator, and wherein the irregular segment extends beyond the first coil end group through a third coil end portion shaped similar to the first coil end portions.

5. The rotary electric machine according to claim 1, further comprising a fan, wherein the segments form a coil end group on an axial end of the stator, and wherein the irregular segment provides a lead extending beyond the coil end group, the lead being disposed on a passage of cooling wind generated by the fan.

6. The rotary electric machine according to claim 1, wherein the regular segments have first coil end portions to form a first coil end group on a first end of the stator and second coil end portions to form a second coil end group on a second end of the stator, and wherein the irregular segment provides an irregular connection different from the regular segments and has a fourth coil end portion shaped similar to the first coil end portions.

7. The rotary electric machine according to claim 1, wherein the segments form a coil end group on an axial end of the stator, and wherein the irregular segment provides a lead extending beyond the coil end group.

8. The rotary electric machine according to claim 1, wherein the second insulating layer is made of a different material from the first insulating layer.

9. The rotary electric machine according to claim 8, wherein the first insulating layer is made of a polyester-imide and the second insulating layer is made of the polyester-imide and a polyamide-imide.

10. The rotary electric machine according to claim 8, wherein

the first insulating layer is made of a polyester-imide and the second insulating layer includes a polyamide-imide.

11. The rotary electric machine according to claim 1, wherein the second insulating layer is thicker than the first insulating layer.

12. The rotary electric machine according to claim 1, wherein the second insulating layer is provided on the irregular segment only.